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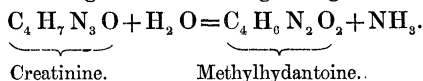
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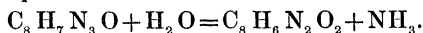
present with remarking that I am inclined to regard the base $C_8H_7N_3O$ as the creatinine of the benzoic series ; it stands to anthranilic acid exactly in the same relation as creatinine "par excellence" does to sarcosine :—



Herr Neubauer has shown* that creatinine, when treated in a sealed tube with baryta-water, undergoes the following change :—



I consider it highly probable that the base $C_8H_7N_3O$ will split up in like manner with the formation of the above-described compound $C_8H_6N_2O_2$, according to the equation



Indeed this latter compound exhibits great resemblance in its chemical deportment to the methylhydantoine of Herr Neubauer.

In conclusion, I should point out that the azodioxindol described by Herrn Baeyer and Knop in their paper on indigo-blue* is isomeric with the before-mentioned compound, $C_8H_6N_2O_2$. These two bodies show, moreover, great similarity in other respects, so much so that I should feel inclined to view them as identical if their fusing-points did not differ essentially. Herrn Baeyer and Knop state that the fusing-point of their azodioxindol is $300^\circ C.$, while the compound I obtained fuses above $350^\circ C.$ Should it turn out, however, on further investigation that the two bodies are identical, the compound $C_8H_6N_2O_2$ would have to be regarded as the first derivative of indigo which has ever been prepared synthetically, and which, like indigo-blue itself, contains eight atoms of carbon.

VI. "On the successive Action of Sodium and Iodide of Ethyl on Acetic Ether." By J. ALFRED WANKLYN, F.C.S. &c. Communicated by Professor WILLIAMSON. Received July 16, 1869.

In a remarkable paper which appeared in the Philosophical Transactions, vol. clvi. p. 37 (1866), Frankland and Duppa described the products obtained on treatment with iodide of ethyl of the yellow wax-like mass given by the action of sodium on acetic ether. Besides the description of the compounds, Frankland and Duppa give a theory of their origin,

* Ann. der Chem. und Pharm. vol. cxl. p. 26.

which theory is embodied in four equations expressive of Frankland and Duppa's view of the origin of the wax-like mass. As I have already pointed out, each one of these four equations affirms the evolution of an equivalent of hydrogen by every equivalent of sodium employed.

I have shown that acetic ether does not evolve hydrogen by reaction with the alkali metals. Equations which assume evolution of hydrogen in these reactions are therefore, in my opinion, inadmissible.

At the end of my paper in the January Number of Liebig's 'Annalen,' I promised to give an explanation of Frankland and Duppa's products, which should not involve the assumption of evolution of hydrogen. That explanation I now give.

On reference to Frankland and Duppa's paper just cited, it will be found that the products described by them as obtained from the "wax-like mass" and iodide of ethyl are the following:—

A. $C_8 H_{14} O_3$, liquid boiling at $195^\circ C.$,

B. $C_{10} H_{18} O_3$, liquid boiling at $210^\circ C.$ to $212^\circ C.$,

butyric ether, caproic ether, and also some unacted upon acetic ether, and a considerable quantity of common ethylic ether.

The history of these compounds is therefore the task set before me.

I have already shown that the direct products of the action of sodium on acetic ether are ethylate of sodium and sodium-triacetyl. Nothing else seems to be produced directly. But the excess of acetic ether, which is necessarily taken, acts on some of the ethylate of sodium, producing alcohol and acetate of ethylene-sodium in the manner described by me on a former occasion. (Of course the extent to which this secondary action takes place will be determined by the exact circumstances of the experiment.) We have, therefore, in the wax-like mass got by prolonging the action of sodium on acetic ether:—

Ethylate of sodium	$C_2 H_5 NaO$
Sodium-triacetyl	$C_6 H_9 O_3 Na$
Acetate of ethylene-sodium.	$C_4 H_7 Na O_2$
Alcohol	$C_2 H_6 O.$

On the first three iodide of ethyl acts, giving iodide of sodium and organic liquids.

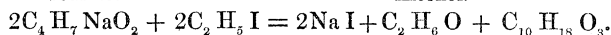
From the ethylate of sodium comes the common ether.

From the sodium-triacetyl comes ethyl-triacetyl, which is $A=C_8 H_{14} O_3$, having been got by Geuther from the pure sodium-triacetyl.

From isolated acetate of ethylene-sodium and iodide of ethylene I have recently obtained liquid B, $C_{10} H_{18} O_3$, thus:—

Acetate of ethylene-
sodium.

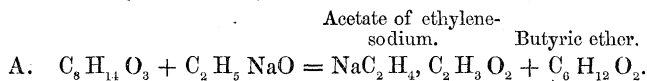
Alcohol.



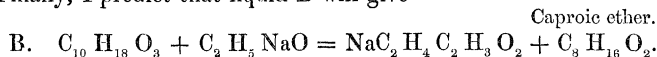
The liquid prepared by me boiled at $212^\circ C.$, and gave carbonate of

baryta with baryta-water, and was identical with Frankland and Duppa's liquid B.

By the action of liquid A upon ethylate of sodium Geuther has recently shown that butyric ether is produced. Geuther's reaction I write thus :—



Finally, I predict that liquid B will give



VII. "On Approach caused by Vibration." By FREDERICK GUTHRIE. Communicated by Prof. G. G. STOKES, Sec. R. S. Received August 26, 1869.

(Abstract.)

The author observes that when a vibrating tuning-fork is held near to a piece of cardboard, the latter has a tendency to approach the fork. Starting from this experiment, a series of experiments is described having for their object the determination of the cause and conditions of the fundamental observed fact.

It is shown that no sensible permanent air-currents, having their source at the fork's surface, are established; and hence that the approach of the card to the fork is not due to the expansion of such currents as in M. Clement's experiment.

The modifications are examined which Mr. Faraday's surface-whirlwinds on a vibrating tuning-fork undergo when the fork vibrates in the neighbourhood of a sensibly rigid plane.

It is shown that a delicately suspended card approaches the fork when either of the three essential faces of the fork is presented to the card, and that the approach takes place from distances far exceeding the range of Mr. Faraday's air-current. That the action between the card and fork is mutual is shown by suspending the latter. Also one vibrating fork tends to approach another in whatever sense their planes of vibration may be towards one another.

The mean tension of the air surrounding a vibrating fork is examined by enclosing one limb of the fork in a glass tube. It appears that the vibrating fork displaces air.

The question whether the equilibrium between two equal and opposite forces acting on a body is disturbed by submitting one of the forces to successive, rapid, equal, and opposite alterations in quantity, is answered in the negative by an experiment which shows that the equilibrium of a Cartesian diver is not disturbed by submitting the water in which it floats to vibration.

Various modifications are introduced into the nature of the surface